

REMARKS

Claims 1-11 and 14-17 are pending in the present application after entry of the present amendment. Claims 1-3, 7-11, and 14-17 are rejected under 35 U.S.C. § 102(e) as being anticipated by Lindholm et al., U.S. Patent No. 6,553,523 ("Lindholm"). Claim 4 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Lindholm in view of Turner et al., U.S. Patent No. 6,629,311 ("Turner"). Claims 5 and 6 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Lindholm in view of Turner, and further in view of "JTAG Boundary Scan Basics White Paper (the "JTAG White Paper"). Claims 9, 10, 11, 12, 14 and 15 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Lindholm in view of Veenstra, U.S. Patent 6,704,889. Claim 12 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Lindholm in view of Veenstra and further in view of Khu, U.S. Patent No. 5,805,607 ("Khu"). Claim 15 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Lindholm in view of Veenstra and further in view of Giel, U.S. Patent Application Publication No. 2004/0015908.

In response to the rejection of the claims, Applicant has amended each of the independent claims. Applicant respectfully requests favorable reconsideration of the claims and withdrawal of the pending rejections in view of the present amendment and in light of the following discussion.

Rejections Under 35 U.S.C. § 102

In response to the rejection of Claims 1-3, 7-11, and 14-17 under 35 U.S.C. § 102(e) as being anticipated by Lindholm, Applicant has amended each of the independent Claims 1, 9, 16 and 17 to overcome the rejection. In particular, Applicant has amended Claim 1 to recite that the method comprises "using boundary scan registers of the programmable logic device to capture" configuration process signals in the programmable logic device "during the configuration process." Applicant has also amended Claim 1 to recite "using the boundary scan registers to transfer" the captured configuration process signals to a configuration analyzer "during the configuration process." Support for the amendments may be found at least in paragraphs [0028]-[0031] in reference to Fig. 3. Applicant respectfully submits that Lindholm fails to

disclose or suggest using boundary scan registers to capture configuration process signals in the programmable logic device during the configuration process. Lindholm also fails to disclose or suggest using boundary scan registers to transfer the captured configuration process signals to a configuration analyzer during the configuration process. The reading back of data described in Lindholm represents data that is read from the PLD after the configuration process, which in Lindholm may be used to verify the configuration of the PLD. See, e.g., Fig. 3 and at col. 6, lines 43-52 of Lindholm.

However, in many cases of configuration failure, no configuration data is ever written to configuration memory. Therefore, reading back configuration data is not useful in debugging the configuration process of a programmable logic device. For example, a configuration failure may occur when there is a violation of the data transfer protocol, where data transfer protocols may vary according to the configuration interface being used. In contrast, the present invention allows for debugging the configuration process itself, which as noted in the specification is a difficult problem. In particular, Applicant claims steps of using boundary scan registers of the programmable logic device to capture configuration process signals in the programmable logic device during the configuration process, and using the boundary scan registers to transfer the captured configuration process signals to a configuration analyzer during the configuration process. Therefore, for at least the foregoing reasons, Applicant believes Claim 1 is allowable, and respectfully requests allowance of Claim 1.

Claims 2-3 and 7-8 depend from Claim 1, and thus include all of the limitations of Claim 1. Therefore, for at least the same reasons, Applicant believes Claims 2-3 and 7-8 are also allowable, and respectfully requests allowance of the claims.

In response to the rejection of Claim 9, Applicant has amended Claim 9 to indicate that the configuration analyzer is coupled to the configuration device for driving configuration process signals through the configuration device in single steps. Applicant has further amended Claim 9 to indicate that the programmable logic device has boundary scan registers, and that the configuration analyzer processes "signals stored in the boundary scan registers" of the programmable logic device "during the configuration process." Support for the amendments may be found at least in

paragraphs [0028]-[0031] in reference to Fig. 3 and paragraph [0034] in reference to Fig. 4. Applicant respectfully submits that Lindholm fails to disclose or suggest a configuration analyzer which is coupled to the programmable logic device and the configuration logic device to drive configuration process signals through the configuration device in single steps, or which processes signals stored in the boundary scan registers of the programmable logic device during the configuration process. Therefore, Applicant believes Claim 9, as amended, is allowable, and allowance of Claim 9 is respectfully requested.

Claims 10-11 and 14-15 depend from Claim 9, and thus include all of the limitations of Claim 9. Therefore, for at least the same reasons that Claim 9 is believed allowable, Applicant believes Claims 10-11 and 14-15 are also allowable, and respectfully requests allowance of the claims.

In response to the rejection of Claim 16, Applicant has amended Claim 16 to recite code sections executable by a machine for causing the machine to perform the step of using boundary scan registers of the programmable logic device to capture configuration process signals in the programmable logic device during the configuration process, and using the boundary scan registers to transfer the captured configuration process signals to a configuration analyzer during the configuration process. Support for the amendments may be found at least in paragraphs [0028]-[0031] in reference to Fig. 3. Therefore, Applicant believes Claim 16 is also allowable for the same reasons that independent Claim 1 is believed allowable, and respectfully requests allowance of Claim 16.

In response to the rejection of Claim 17, Applicant has amended the claim to indicate that the means for capturing configuration process signals comprises means for capturing configuration process signals "in boundary scan registers" as they are received by the programmable logic device at each step; and that the means for comparing compares the captured configuration process signals output by the boundary scan registers in a JTAG chain with expected configuration process signals "during the configuration process." Lindholm fails to disclose or suggest such means. Support for the amendments may be found at least in paragraphs [0028]-[0031] in

reference to Fig. 3. Therefore, Applicant believes Claim 17 is also allowable and respectfully requests allowance of Claim 17.

Rejections Under 35 U.S.C. § 103

Claim 4 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Lindholm in view of Turner et al., U.S. Patent No. 6,629,311 ("Turner"). Applicant respectfully submits that Turner fails to overcome the deficiencies of the primary reference Lindholm. While Lindholm discloses the readback of configuration data after configuration is complete, Turner discloses a JTAG interface circuit which may be used to access a configuration controller. However, neither reference discloses or suggests steps of using boundary scan registers of the programmable logic device to capture configuration process signals in the programmable logic device during the configuration process, or using the boundary scan registers to transfer the captured configuration process signals to a configuration analyzer during the configuration process. Therefore, Applicant believes Claim 4 is allowable for the same reason that independent Claim 1 is believed allowable, and respectfully requests allowance of Claim 4.

Claims 5 and 6 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Lindholm in view of Turner, and further in view of "JTAG Boundary Scan Basics White Paper (the "JTAG White Paper"). The JTAG White Paper is cited for disclosing the specific JTAG steps of Claims 5 and 6. However, the JTAG White Paper also fails to overcome the deficiencies of the primary reference Lindholm for the same reasons set forth above with respect to Claim 4. Applicant submits that Claims 5 and 6 are allowable over the combination of references, and respectfully requests allowance of Claims 5 and 6.

In response to the rejection of Claims 9, 10, 11, 14 and 15 as being unpatentable over Lindholm in view of Veenstra, U.S. Patent 6,553,523, Applicant has amended Claim 9 to indicate that the programmable logic device has boundary scan registers, and that the configuration analyzer analyzes configuration process signals stored in the boundary scan registers of the programmable logic device during the configuration process. Applicant respectfully submits that the claims are allowable in

view of the amendments to the independent Claim 9. Both Lindholm and Veenstra fail to disclose or suggest a configuration analyzer coupled to the programmable logic device and which processes signals stored in the boundary scan registers of the programmable logic device during the configuration process. Further, the embedded logic analyzer of Veenstra, which is on the programmable logic device, could only exist after configuration of the programmable logic device. Accordingly, any combination of the references would not lead to Applicant's Claim 9. Applicant submits that Claim 9 as amended is also allowable over a combination of Lindholm and Veenstra. Applicant submits that dependent Claims 9, 10, 11, 14 and 15 are allowable for the same reasons that independent Claim 9 is believed allowable, and respectfully requests reconsideration of the rejection.

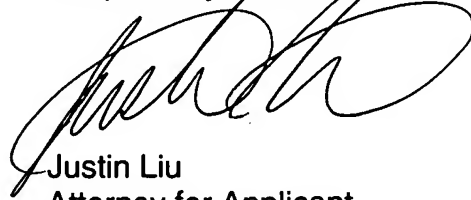
The rejection of Claim 12 as being unpatentable over Lindholm in view of Khu is moot in view of the cancellation of Claim 12.

Finally, in response to the rejection of Claim 15 as being unpatentable over Lindholm in view of Veenstra and further in view of Giel, Applicant respectfully submit that Claim 15 is allowable over the combination of references for the same reason that Claim 14 is believed allowable. Giel is cited for disclosing a configuration analyzer having a database of known configuration problems. However, Giel also fails to disclose or suggest a configuration analyzer coupled to the programmable logic device and which processes signals stored in the boundary scan registers of the programmable logic device during the configuration process. Applicants respectfully request reconsideration of the rejection of Claim 15.

Conclusion

No new matter has been introduced by any of the above amendments. In light of the above amendments and remarks, Applicant believes that Claims 1-11 and 14-17 are in condition for allowance, and allowance of the application is therefore requested. If action other than allowance is contemplated by the Examiner, the Examiner is respectfully requested to telephone Applicant's attorney, Justin Liu, at 408-879-4641.

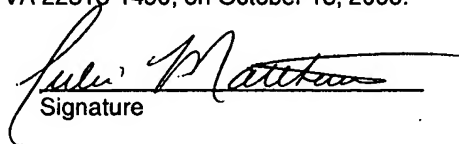
Respectfully submitted,



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I hereby certify that this correspondence is being deposited with the United States Postal Service as first-class mail in an envelope addressed to: Commissioner for Patents, P.O. BOX 1450, Alexandria, VA 22313-1450, on October 13, 2006.

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Signature